

Claims

- [1] A crushing apparatus comprising:
- a supplying section for receiving a solid material;
 - at least one crushing section for crushing the material supplied from the supplying section; and
 - a discharging section for discharging the material crushed by the crushing section to outside;
- wherein the at least one crushing section is formed by partitioning with a rotating disk on a side of the supplying section and a rotating disk on a side of the discharging section connected to at least one rotating shaft to be driven to rotate and arranged at positions spaced apart from each other in an axial direction;
- wherein at least one of the rotating disk on the side of the supplying section and the rotating disk on the side of the discharging section is arranged with at least one blade projected from a face thereof opposed to each other and formed with a through hole penetrated in the axial direction and a position proximate to a rotational axis center of the rotating disk and at a position of at least one section thereof in a circumferential direction; and
- wherein a material supplied from the supplying section is constituted to be crushed by a crushing operation produced in accordance with driving to rotate the blade in the crushing section and made to communicate with the side of the discharging section constituting a downstream side via the through hole formed at the at least one rotating disk.
- [2] The crushing apparatus according to Claim 1, constituted such that a plurality of the blades are arranged on the at least one rotating blade radially by directing a

blade face thereof in a rotational direction of the rotating disk along the circumferential direction centering on the rotational axis center, further, a position between the blades contiguous to each other in the circumferential direction is attachably and detachably arranged with at least one sub-blade following the preceding blade immediately therebefore in the rotating direction of the rotating disk, and a direction of the blade face of the sub-blade relative to the blade face of the preceding blade immediately therebefore is pertinently adjusted.

[3] The crushing apparatus according to Claim 1 or Claim 2, wherein a position between the rotating disk on the side of the supplying section of the crushing section and the rotating disk on the side of the discharging section is arranged in parallel with a guide disk connected to the rotating shaft of one of the rotating disks and driven so as to rotate, and the guide disk is formed with a guide face having a shape to guide a powder in the crushing section to a position of arranging the blade in accordance with driving to rotate the guide disk.

[4] The crushing apparatus according to any one of Claim 1 through Claim 3, wherein a peripheral wall face of the crushing section is provided with a guide projection having a shape of guiding the powder flowing from an upstream side to a downstream side along the peripheral wall face from the peripheral wall face to an inner side.

[5] The crushing apparatus according to any one of Claim 1 through Claim 4, constituted such that the rotating disk on the side of the supplying section and the rotating disk on the side of the discharging section are respectively connected to at

least two rotating shafts driven to rotate by producing a relative rotational speed difference and an interactive application of a crushing force is produced by the relative rotational speed difference between the two rotating disks.

[6] The crushing apparatus according to any one of Claim 1 through Claim 5, wherein an outer peripheral edge portion of the rotating disk formed to partition the crushing section and the discharging section is attachably and detachably arranged with at least one impact blade having a shape of facing a peripheral wall face disposed on an outer side in a radius direction of a disk face on a side of the discharging section thereof at the disk face on the side of the discharging section, and a face portion on an outer side in a radius direction of the impact blade opposed to the peripheral wall face is formed with a plurality of escape grooves having a shape penetrated in a rotational direction thereof along the axial direction.

[7] The crushing apparatus according to any one of Claim 1 through Claim 6, wherein the rotating disk for partitioning so as to form the crushing section and the discharging section is attachably and detachably arranged with a classifying blade having a shape projected to a side of the discharging section, and the powder discharged from a gap between an outer peripheral face of the rotating disk and the peripheral wall face of the crushing section is constituted to be sorted from a gap between the classifying blades in a rotational state to be discharged to the discharging section, and a number of arranging the classifying blades is pertinently adjusted.

[8] The crushing apparatus according to Claim 7, wherein a wall face of the discharging section is further attachably and detachably arranged with a gap-adjusting

member for narrowing the wall face and a portion of the classifying blade on a side of a rotating end thereof, and the gap-adjusting member for adjusting the gap to a predetermined dimension is pertinently selected to arrange.

[9] The crushing apparatus according to Claim 7 or Claim 8, wherein a through hole is formed at the rotating disk used for partitioning in order to form the crushing section and the discharging section;

wherein the classifying blade is attached at a position more proximate to the rotational axis center than a position of forming the through hole relative to the rotating disk, and a classifying section for classifying the powder discharged from the through hole is partitioned to form at an outer region in a direction of a rotating radius of the classifying blade; and

wherein the classifying section is arranged with a classifying cylinder formed in a shape of a cylinder along a position between the classifying blade and the peripheral wall face on the outer side in the direction of the rotating radius of the classifying blade.

[10] The crushing apparatus according to Claim 9, wherein the classifying cylinder is arranged attachably and detachably to and from the peripheral wall face of the classifying section, and the classifying cylinder having a shape of enlarging a cylinder diameter from the upstream side to the downstream side or a shape of making the cylinder diameter constant is pertinently selected to be arranged.

[11] The crushing apparatus according to Claim 9 or 10, wherein the classifying cylinder is arranged attachably and detachably to and from the peripheral wall face of

the classifying section, and a dimension of a gap between the classifying cylinder and the rotating disk for partitioning to form the crushing section and the discharging section and a dimension of a gap between the classifying cylinder and the peripheral wall face of the classifying section are pertinently adjusted by a position of attaching the classifying cylinder.

[12] The crushing apparatus according to any one of Claim 1 through Claim 11, wherein the through hole is formed at the rotating disk for partitioning to form the crushing section and the discharging section; and

wherein the rotating disk is formed with a thick-walled face section for applying a resistance against a flow of the powder discharged from the through hole in accordance with rotating the rotating disk at a disk face thereof on a side of the discharging section, and the thick-walled face portion is constituted by a shape of gradually thickening a wall thickness thereof gradually to an inner side in a radius direction.